Introduction

What is the Toxics Release Inventory?

The Toxics Release Inventory, or TRI, is a publicly-available data set containing information reported annually for toxic chemicals manufactured, processed, or otherwise used by certain facilities in Delaware and throughout the United States. Annually, these facilities report releases and waste management information for covered chemicals. The reportable list of toxic chemicals for 2001 included 582 individual chemicals and 30 chemical categories. TRI was established in 1986 under Title III, Section 313, of the Federal Superfund Amendments and Reauthorization Act to provide information to the public about the presence and release of toxic chemicals in their communities. Title III is also known as the Emergency Planning and Community Right-to-Know Act (EPCRA).

Facilities report TRI information to the U.S. Environmental Protection Agency (EPA) and to the State in which the facility is located. In Delaware, the EPCRA Reporting Program within the Department of Natural Resources and Environmental Control (DNREC) receives and compiles TRI data from facilities located within the State. The EPCRA Reporting Program maintains a database that is updated as new reports are received. The database currently contains fifteen years of reported data. Most releases reported under TRI are also regulated through Federal and/or State permits.

This report provides a summary and brief analysis of the 2001 TRI data received as of March 1, 2002 from Delaware facilities.

Reporting Requirements

A facility is required to submit a report for a listed toxic chemical if the facility meets all of the following criteria:

1. Employs the equivalent of 10 or more full-time employees,
2. Is a covered industry, or is a federal facility (See Table 1, on the next page, for a list of covered industries), and,
3. Manufactures or processes more than 25,000 pounds, or otherwise uses more than 10,000 pounds, of the listed toxic chemical during the course of the calendar year. Limits for specific chemicals known as PBT's (Persistent Bioaccumulative Toxics) are lower (Table 2 on page 3).

Facilities that meet the criteria for reporting must submit one report for each listed toxic chemical manufactured, processed, or otherwise used above threshold quantities. Facilities must submit these reports to DNREC and EPA by July 1 of each year. The reports cover activities during the previous calendar year. It is important to note that a facility may need to report even if it has no releases of the toxic chemical, because reporting is based on the amount manufactured, processed, or otherwise used, and not the amount released.

TABLE 1
COVERED INDUSTRIES

SIC CODES	INDUSTRY
10XX	Metal Mining
12XX	Coal Mining
20-39XX	Manufacturing
4911 4931 4939	Oil and Coal Fired Electric Utilities
4953	Facilities Regulated Under RCRA Subtitle C
5169	Wholesale Chemical Distributors
5171	Wholesale Petroleum Stations and Terminals
7389	Solvent Recovery Services
	Federal Facilities

Table 1 provides a list of covered industries along with corresponding 4-digit Standard Industrial Classification (SIC) codes. SIC codes are used to identify the type of activities performed at a facility. Each industry sector represented by facilities reporting in Delaware for 2001 is described in Table 5 on page 10.

The standard report (Form R) contains general facility information and data about on-site releases, off-site transfers, and on-site waste management activities. In lieu of Form R, the short form (Form A) may be used, provided certain criteria are met. After a facility determines that it must report on a given chemical, the facility is eligible to use Form A for that chemical if:

1. The sum of the annual releases, transfers, and wastes managed on-site (known as the "reportable amount") does not exceed 500 pounds, and,
2. The total annual amount of the chemical manufactured, processed, or otherwise used does not exceed 1,000,000 pounds.

Form A, initiated in the 1997 reporting year, is a two-page report that provides facility information (essentially the same as Form R) and the identification of the chemical, but does not provide any release, transfer, or waste management data.

Recent Developments in TRI Reporting

The TRI reporting requirements change as EPA seeks to improve the program through changes to the list of reportable chemicals and through program expansions. As a result of these changes, considerable caution must be exercised when comparing TRI data from previous years. Some of the data presented later in this report will be adjusted for these changes in order to present the data on a more constant reporting basis from year to year. Notations will be made to indicate which data is presented with these adjustments.

Persistent, Bioaccumulative, Toxic (PBT) Chemicals

For reporting year 2000 and beyond, EPA established substantially lower reporting thresholds for 15 chemicals and three chemical categories that are highly persistent and bioaccumulative in the environment (PBT's). Five of these were newly added in 2000. The new thresholds apply regardless of whether the PBT chemical is manufactured, processed, or otherwise used. Table 2 provides a list of the PBT chemicals and their thresholds.

Beginning with reporting year 2001 and beyond, lead and lead compounds also have a reduced threshold of 100 pounds, down from the previous 25,000 pounds for manufactured and processed and 10,000 pounds otherwise used thresholds, except lead contained in stainless steel, brass, or bronze alloys.

TABLE 2
PBT CHEMICALS AND REPORTING THRESHOLDS
(pounds/year)

Chemical or Chemical Category	Threshold
Aldrin	100
Benzo[g,h,I]perylene	10
Chlordane	10
Dioxin and dioxin-like compounds	0.1 grams
Heptachlor	10
Hexachlorobenzene	10
Isodrin	10
Lead *	100
Lead compounds *	100
Mercury	10
Mercury compounds	10
Methoxychlor	100
Octachlorostyrene	10
Pendimethalin	100
Pentachlorobenzene	10
Polychlorinated biphenyls (PCB's)	10
Polycyclic aromatic compounds	100
Tetrabromobisphenol A	100
Toxaphene	10
Trifluralin	100

* Lower Threshold Beginning with 2001 Reports

Lead is a naturally occurring bluish-gray metal found in small amounts in the earth's crust. Lead can be found in all parts of our environment. Much of it comes from human activities including burning fossil fuels, mining, and manufacturing. Exposure to lead can happen from breathing workplace air or dust, eating contaminated foods, or drinking contaminated water. Children can be exposed from eating lead-based paint chips or playing in contaminated soil. Lead can damage the nervous system, kidneys, and reproductive system. Lead is listed as a possible carcinogen by the International Agency for Research on Cancer. Additional information on lead and lead compounds can be found starting on page 21 and on PBT's on page 31.

Industry Expansion

On May 1, 1997, EPA added seven industries to the list of facilities covered under TRI. Prior to the 1998 reporting year, only manufacturers (SIC codes 20XX-39XX) and federal facilities were required to report (See Table 1 on page 2). EPA included the seven industries because facilities within these industries manufacture and use substantial quantities of TRI chemicals and engage in activities related to those conducted by manufacturing facilities. The industry expansion significantly increased the amount of reported releases. This did not necessarily represent an increase in toxic releases in Delaware, but rather additional information that was

made available to the public. Again, some of the data presented later in this report will be adjusted for these changes in order to present the data on a more constant reporting basis from year to year.

Chemical List Changes

The number of reportable chemicals substantially increased for the 1995 reporting year and beyond, including the addition of over 200 chemicals and six chemical categories. In response to the increased reporting burden on industry resulting from the chemical list expansion of 1995, EPA initiated the use of Form A described on page 2. The only recent significant deletion was phosphoric acid in 1999. It was reported by 11 facilities in 1998.

Carcinogenic TRI Chemicals

TABLE 3
CARCINOGENS REPORTED BY DELAWARE FACILITIES FOR 2001

CHEMICAL	IARC RATING	NO. OF REPORTS
ACRYLONITRILE	2A	1
ASBESTOS (FRIABLE)	1	1
BENZENE	1	7
1,3-BUTADIENE	2A	2
CHLOROFORM	2B	1
CHROMIUM COMPOUNDS	1	7
COBALT COMPOUNDS	2B	2
DI(2-ETHYLHEXYL) PHTHALATE	2B	1
DICHLOROMETHANE	2B	1
1,3-DICHLOROPROPYLENE	2B	1
DIETHYL SULFATE	2A	1
ETHYL ACRYLATE	2B	2
ETHYLBENZENE	2B	5
ETHYLENE OXIDE	1	2
FORMALDEHYDE	2A	1
HEXACHLOROBENZENE	2B	1
LEAD	2B	6
LEAD COMPOUNDS	2B	15
4,4'-METHYLENEBIS(2-CHLOROANILINE)	2A	1
NICKEL	2B	1
NICKEL COMPOUNDS	1	7
NITROBENZENE	2B	1
P-CHLOROANILINE	2B	1
POLYCHLORINATED BIPHENYLS	2A	1
POLYCYCLIC AROMATIC COMPOUNDS	2A,B	13
PROPYLENE OXIDE	2B	1
STYRENE	2B	7
TETRACHLOROETHYLENE	2B	2
TOLUENE DIISOCYANATE (MIXED)	2B	2
TRICHLOROETHYLENE	2A	2
VINYL ACETATE	2B	2
VINYL CHLORIDE	1	2
	TOTAL =	100

Some chemicals are reportable under TRI because they are either known or suspected human carcinogens. Known human carcinogens are those that have been shown to cause cancer in humans. Suspected carcinogens are those that have been shown to cause cancer in animals. Table 3 contains those known and suspected carcinogens that were reported by Delaware facilities for 2001. Next to each chemical is its International Agency for Research on Cancer (IARC) rating as a: Known (1), Probable (2A), or Possible (2B) carcinogen. Polycyclic aromatic compounds is a class of chemicals with chemicals in both 2A and 2B IARC classifications. Of the 8.3 million pounds of TRI chemicals reported by facilities as released on-site to the environment in 2001, 6.6% (550,000 pounds) were known or suspected carcinogens. Releases on-site of all carcinogens have decreased 17% this year and 35% since its peak in 1998. For additional information on cancer rates and causes, please go to the Public Health cancer web site listed in the “For Further Information” section on page 41. Additional carcinogen detail is presented in the Trend Analysis section on page 39.

Pollution Prevention/Reduction Programs in Delaware

The Delaware Pollution Prevention Program in the Department of Natural Resources and Environmental Control (DNREC) facilitates the implementation of pollution prevention by industry, government and society. The Pollution Prevention Program (P2 Program) serves a non-regulatory function to provide information, technical assistance, training, and leadership on issues related to reducing and eliminating our generation of wastes and pollutants. The early years of the P2 program concentrated on industry and its wastes. In recent years the program has assisted all aspects of Delaware's society, including expanded efforts to schools, environmental organizations, commercial and service businesses, and to state government itself.

Data for TRI reportable chemicals and other chemicals is becoming increasingly more available to the public. This public awareness has focused attention on the existence and quantity of these chemicals and on their management and possible reduction. Although EPCRA does not require a facility to reduce releases of chemicals reportable under its programs, many companies and facilities have implemented programs to reduce or eliminate releases of these chemicals. These programs may take the form of efficiency improvements, reuse, recycling, energy recovery, or material substitutions. The benefits of these programs are reduced raw material and waste disposal costs and reduced risks associated with the toxic chemicals. Also, these reductions demonstrate corporate responsibility to the facility neighbors, and improve the corporate image with the public.

There are numerous programs within DNREC that impact the management of TRI chemicals through the issuance of permits or through other regulatory and non-regulatory activities. Most releases reported under TRI are also regulated through air emission, water discharge, and/or land disposal permits. Potential sources of toxics undergo technical reviews through which potential threats to the environment and to human health are reviewed prior to issuance of a permit. For example, the Engineering and compliance Branch in the Air Quality Management Section enforces a provision in the Clean Air Act Amendment of 1990 that targets the control of hazardous air pollutants (HAPs). Nearly all HAPs are also reportable TRI chemicals. Also, the Engineering and Compliance staff monitor TRI data to assess whether a facility is in compliance with its Air Permits for TRI chemicals. Another example is the work performed by the Accidental Release Prevention (ARP) program. The ARP staff uses the TRI data to detect possible deficiencies at a facility that might result in an increased probability of an accidental release.

The Solid and Hazardous Waste Management Branch uses the TRI report to measure reductions of releases for the Waste Minimization Priority Chemicals list. The list is a result of EPA's Waste Minimization Program and has measurable goals that Delaware is working to attain. The DNREC Pollution Prevention program offers Consultations to any generator of hazardous waste that requests it. The consultation is non-regulatory and non-enforcement in nature, aimed at helping the company to reduce any and all waste streams, including the priority chemicals.

During 2001 DNREC's Air Quality Management Section monitors ambient air quality at 10 locations around the state. For more information, please refer to the "For Further Information" section under the 2001 Delaware Air quality Report on page 42 of this report.

TOXICS RELEASE INVENTORY

Limitations of TRI Data

The user of TRI data should be aware of its limitations in order to accurately interpret its significance.

- **NOT ALL FACILITIES ARE REQUIRED TO REPORT.** Only a small fraction of facilities in Delaware are required to report under TRI due to the criteria listed on pages 1 and 2.
- **OTHER SOURCES NOT COVERED UNDER TRI ALSO RELEASE TOXIC CHEMICALS.** Other sources include small businesses, motor vehicles, and agricultural operations, as examples. For some chemicals, their use as consumer products is a significant source of releases.
- **FACILITIES ARE ALLOWED TO BASE TRI DATA ON MEASUREMENTS AND MONITORING DATA IF THESE ARE AVAILABLE**. If such data is not available, quantities are estimated based on published emission factors, mass balance calculations, or good engineering judgment. Additional monitoring equipment and measurements are not required.
- **THE DATA ESTIMATION METHODS MAY CHANGE OR VARY.** The methods of estimating, analytical methodology, or basis of calculating data used by different facilities, or even the same facility over time, may vary, and may result in significant changes in reporting while the actual release may remain relatively unchanged. DNREC performs cross-checks of the data with other information sources to verify its accuracy, and contacts facilities concerning apparent discrepancies.
- **REVISIONS TO FORM R MAY OCCUR AT ANY TIME.** These revisions sometimes involve significant changes for data previously reported by a facility.
- **THIS DATA DOES NOT INDICATE AMOUNT OF HUMAN EXPOSURE.** An important consideration to keep in mind is that TRI does not provide an indication of potential exposure to the reported releases and cannot be used by itself to determine the impact on public health. The chemical's release rate, toxicity, and environmental fate, as well as local meteorology and the proximity of nearby communities to the release must be considered when assessing exposures. Small releases of highly toxic chemicals may pose greater risks than large releases of less toxic chemicals. The potential for exposure increases the longer the chemical remains unchanged in the environment. Some chemicals may quickly break down into less toxic forms, while others may accumulate in the environment, becoming a potential source of long term exposure. The chemical exposure of a population depends on the environmental media (air, water, land) into which the chemical is released. The media also affects the type of exposure possible, such as inhalation, dermal exposure, or ingestion.

Despite these limitations, TRI serves as a screening tool to identify areas of concern that may require further investigation.

2001 Data Summary

Statewide totals of reported 2001 TRI on-site releases, off-site transfers, and wastes managed on-site are provided in Table 4. A total of 80 facilities submitted 368 reports on 104 different chemicals. Of the 368 reports, 57 were submitted using form A. Six reports were received on lead and fifteen on lead compounds, compared to three and four, respectively last year. Both had their thresholds reduced to 100 pounds this year as noted on page 3. As in past years, air releases constitute a large portion, 81%, of the total on-site releases.

TABLE 4
2001 TRI DATA SUMMARY
(IN POUNDS)

	2001
No. of facilities	80
No of Form A's	57
No of Form R's	311
No. of Chemicals	104
On-site Releases	
Air	6,766,580
Water	573,937
Land	965,666
Total Releases	**8,306,183**
Off-site Transfers	
POTW's	1,697,026
Recycle	8,725,054
Energy Recovery	2,642,626
Treatment	172,946
Disposal	3,877,093
Total Transfers	**17,114,745**
On-site Waste Mgmt.	
Recycle	24,133,870
Energy Recovery	25,863,740
Treatment	40,675,792
Total on-site Mgmt.	**90,673,402**
Total Waste	**116,094,330**

Types of Data

Table 4 lists all the categories of data reported in Delaware under the TRI program. Within the actual reports from facilities, the data is broken down into additional sub-categories. For ease of presentation in this report, the data has been grouped into these categories as described below.

On-Site Releases: There are four categories, but no **underground injection** of chemical waste to wells is permitted in Delaware. On-site releases in Delaware are to **air, water,** or **land**. The **air** release category includes stack air collected by mechanical means such as vents, ducts, or pipes, and fugitive air escaping collection and released into the general atmosphere, including equipment leaks and evaporation. **Water** releases are to streams or water bodies, including streams, rivers, lakes, bays, or oceans. This includes releases from contained sources, such as industrial process outflow or open trenches. Water releases include TRI-reportable chemicals in runoff, including storm water runoff, are also reportable. **Land** releases (5 types) are to RCRA landfills, in which wastes are buried, surface impoundments, which are uncovered holding areas used to volatilize and/or settle waste materials, other land disposal such as waste piles or releases to land such as spills or leaks, land application/treatment in which waste containing a listed chemical is applied to or incorporated into soil, and other non-RCRA landfill.

Off-Site Transfers: Off-site transfers include transfer of chemical waste to **POTW"s** (Wastewater Treatment Plants), to **recycle** operations (5 types), to **energy recovery** operations (2 types), to **treatment** operations (6 types), and to **disposal** (10 types), to facilities not at the facility generating the waste. This total of 23 sub-categories is provided for the purpose of classifying the types of final off-site waste management undertaken for each chemical.

On-site waste Management: Waste management operations at the facility generating the waste are categorized to include **recycle**, **energy recovery**, and **treatment.** These are as described above in Off-Site Transfers.

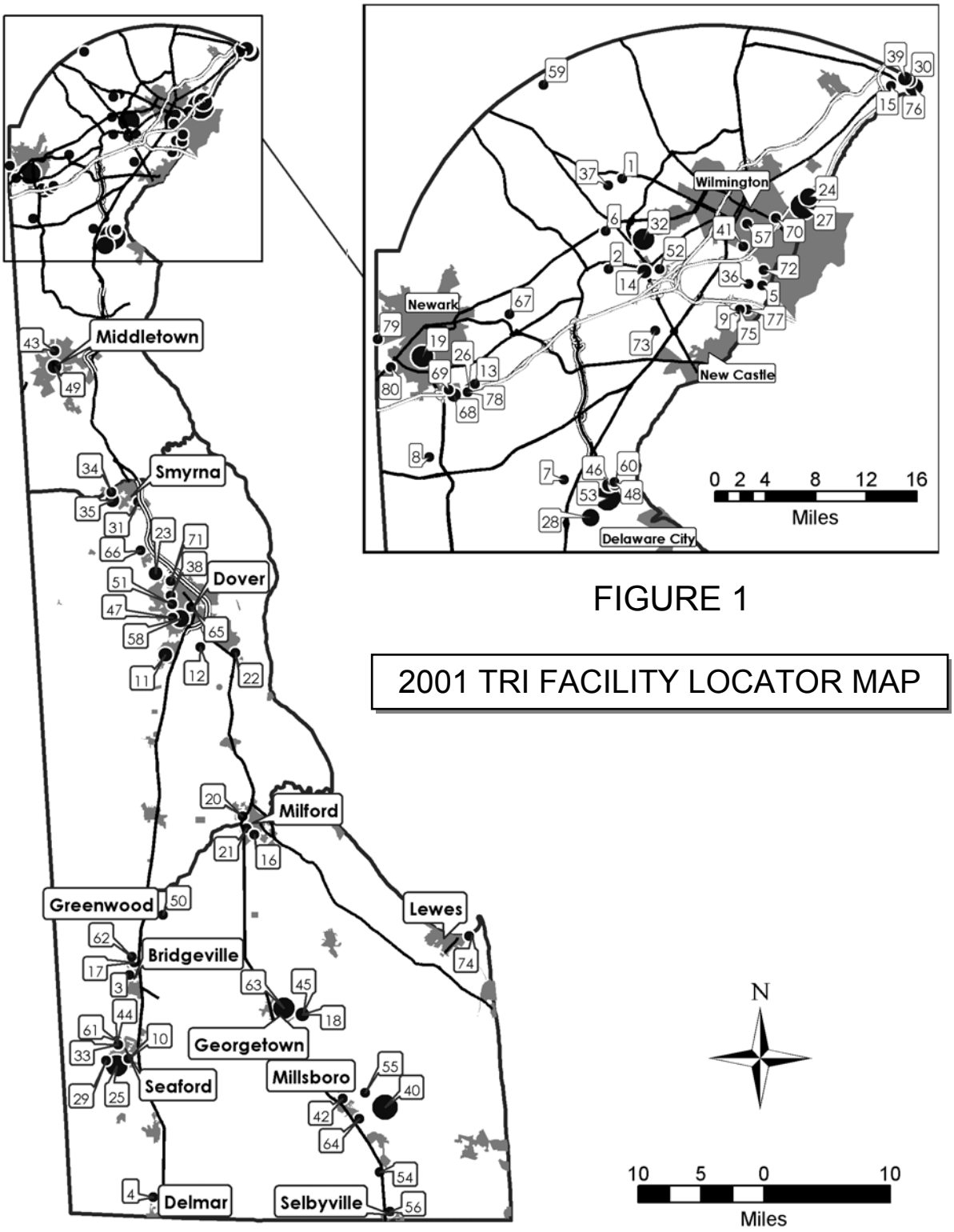


FIGURE 1

2001 TRI FACILITY LOCATOR MAP

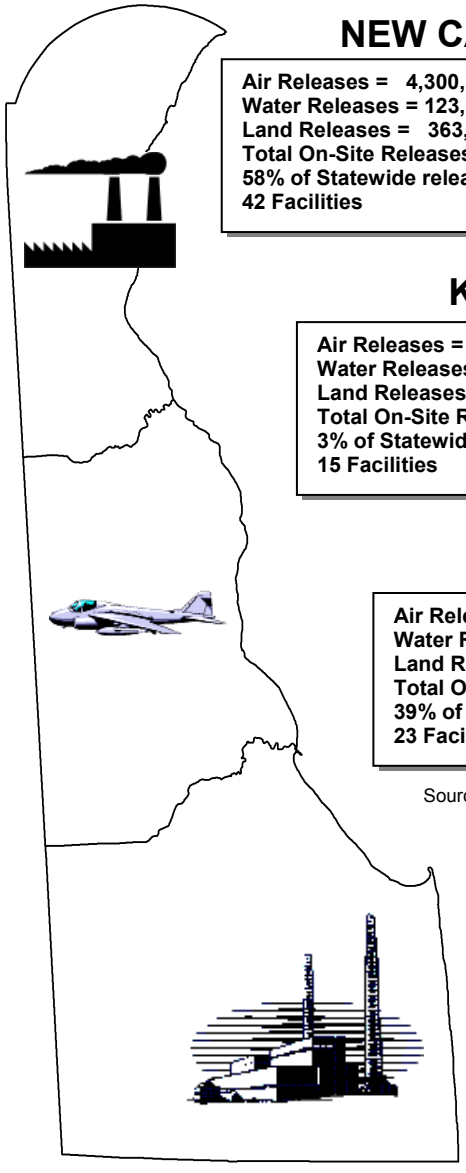
FIGURE 1 MAP KEY

MAP ID	FACILITY
1	AGILENT TECHNOLOGIES LITTLE FALLS
2	AGILENT TECHNOLOGIES NEWPORT
3	AGRILINK FOODS
4	ALLEN'S HATCHERY
5	AMERICAN MINERALS
6	AMETEK
7	ARLON
8	ASTROPOWER
9	AVECIA
10	BLADES BULK PLANT
11	CAMDEL METALS
12	CARL KING
13	CHROME DEPOSIT
14	CIBA SPECIALTY CHEMICALS
15	CITISTEEL
16	CLARIANT
17	CUSTOM DECORATIVE MOLDINGS
18	D & B INDUSTRIAL GROUP
19	DAIMLER CHRYSLER
20	DENTSPLY CAULK MAIN
21	DENTSPLY CAULK WEST
22	DOVER AFB SMALL ARMS RANGE
23	DOW REICHHOLD
24	DU PONT EDGE MOOR
25	DU PONT SEAFORD
26	E-A-R SPECIALTY COMPOSITES
27	EDGE MOOR/HAY RD. POWER PLT.
28	FORMOSA PLASTICS
29	GAC SEAFORD
30	GENERAL CHEMICAL
31	GENERAL CLOTHING
32	GENERAL MOTORS
33	GREEN TREE CHEMICAL
34	HALKO MANUFACTURING
35	HANOVER FOODS
36	HARDCORE COMPOSITES
37	HERCULES RESEARCH CENTER
38	HIRSH INDUSTRIES
39	HONEYWELL
40	INDIAN RIVER POWER PLANT
41	INSTEEL WIRE
42	INTERVET
43	JOHNSON CONTROLS
44	JOHNSON POLYMER
45	JUSTIN TANKS
46	KANEKA
47	KRAFT FOODS
48	KUEHNE CHEMICAL
49	MACDERMID
50	MARBLE WORKS
51	MCKEE RUN POWER PLANT
52	MEDAL
53	MOTIVA
54	MOUNTAIRE FARMS FEEDMILL
55	MOUNTAIRE FARMS OF DELAWARE
56	MOUNTAIRE FARMS OF DELMARVA
57	NORAMCO
58	NRG DOVER
59	NVF YORKLYN
60	OCCIDENTAL CHEMICAL
61	ORIENT
62	PERDUE BRIDGEVILLE
63	PERDUE GEORGETOWN
64	PINNACLE FOODS
65	PLAYTEX PRODUCTS
66	PPG DOVER
67	PPG INDUSTRIES
68	RODEL
69	RODEL TECH CENTER
70	ROLLER SERVICE
71	SERVICE ENERGY DOVER
72	SICO #360
73	SPATZ FIBERGLASS
74	SPI PHARMA
75	SPI POLYOLS, INC.
76	SUNOCO
77	UNIQEMA
78	VP RACING FUELS
79	W.L. GORE BARKSDALE
80	W.L. GORE OTTS CHAPEL

Figure 1 on the facing page provides the location of each reporting facility in the state. The size of the facility location depicts the relative size of its on-site release relative to other facilities in the state. The facility location, telephone number, and contact person is provided in Appendix B. Figure 2 below provides basic on-site release information for each county.

FIGURE 2

ON-SITE RELEASES BY COUNTY



NEW CASTLE

Air Releases = 4,300,548 Pounds
Water Releases = 123,050 Pounds
Land Releases = 363,813 Pounds
Total On-Site Releases = 4,787,411 Pounds
58% of Statewide releases
42 Facilities

KENT

Air Releases = 220,262 Pounds
Water Releases = 0 Pounds
Land Releases = 2,958 Pounds
Total On-Site Releases = 223,220 Pounds
3% of Statewide releases
15 Facilities

SUSSEX

Air Releases = 2,245,770 Pounds
Water Releases =450,887 Pounds
Land Releases = 598,895 Pounds
Total On-Site Releases = 3,295,552 Pounds
39% of Statewide releases
23 Facilities

Source: DNREC 2001 TRI Database 3-1-03

SIC Industry Groups

Table 5 provides a description of each Standard Industrial Classification (SIC) industry group and the number of facilities in each group that reported in Delaware. This table also provides on-site releases, off-site transfers, and wastes managed on-site for each group. All three power plants (SIC 4911) reporting in Delaware combust coal. The one reporting metal mining facility, American Minerals, processes metal ores that they receive by railcar. The 14 new facilities reporting lead and lead compounds at the lower threshold the first time this year are from industry codes 22, 28, 29, 33, 34, 36, 37, 38, and 49. Reporting year 2000 included seven facilities in industry codes 10, 28, 33, 34, 36, and 37, and these facilities continue to report lead and lead compounds.

TABLE 5
2001 TRI DATA BY PRIMARY SIC GROUP

(in pounds)

SIC CODE	INDUSTRY GROUP	NUMBER OF REPORTS	NUMBER OF FACILITIES	FORM A	FORM R	ON-SITE RELEASE	OFF SITE TRANSFERS	ON-SITE WASTE MGMT.
10	Metal Mining	4	1		4	1,396	0	0
20	Food Products	24	10	12	12	347,828	11,453	20,760
22	Textiles	8	2	1	7	34,397	833,833	3,397,596
25	Furniture and Fixtures	1	1		1	12,714	0	0
26	Paper Products	1	1		1	2,252	9,594	4,594,952
28	Chemicals	127	23	10	117	1,011,998	7,958,817	36,056,233
29	Petroleum Refining and Products	56	4	6	50	1,769,234	266,135	30,906,722
30	Rubber and Plastics	18	13	2	16	77,833	104,617	1,856,870
32	Stone, Clay and Glass	1	1		1	0	250	0
33	Primary Metal	14	5		14	20,781	2,469,787	13,100,000
34	Fabricated Metal Products	2	1		2	0	10,891	2,000
36	Electrical Equipment	3	2		3	178	4,316,967	0
37	Transportation Equipment	33	3		33	728,114	821,898	124,884
38	Instruments, Medical Goods	8	3		8	1,203	59,357	350
39	Miscellaneous Manufactuing	1	1		1	2,282	0	0
4911	Oil and Coal Fired Power Plants	40	4		40	4,293,016	251,146	613,035
5171	Wholesale Petroleum Terminals	26	4	26	0	0	0	0
97	National Security	1	1		1	2,958	0	0
	TOTAL	368	80	57	311	8,306,183	17,114,745	90,673,402

FIGURE 3
2001 ON SITE RELEASES BY SIC

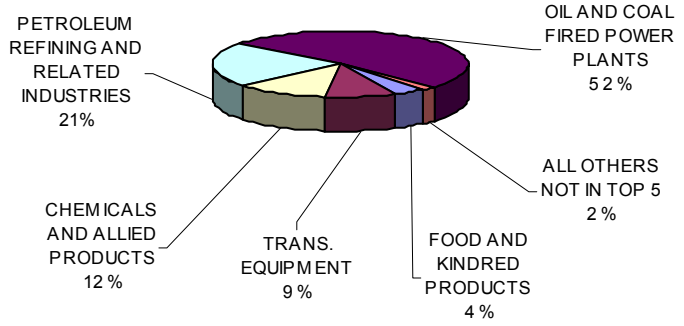


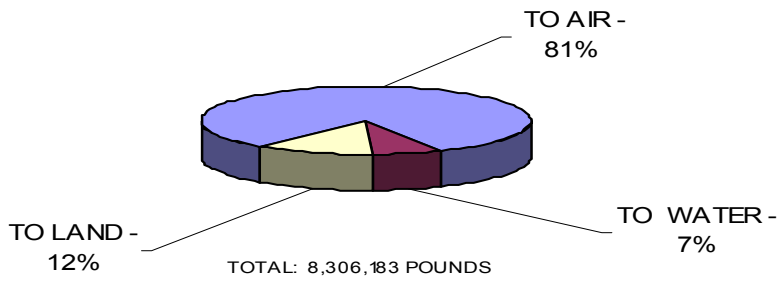
Figure 3 shows the relative contribution of each of the top 5 SIC groups to the total on-site releases and all others not in the top 5. SIC groups 4911 (Oil and Coal Fired Power plants), 29 (Petroleum refining), and 28 (Chemicals) combine for 85% of the total on-site releases within the state. Facilities not in the top 5 industry groups contributed 155,993 on-site pounds, or 1.9% of the total.

On- Site Releases

On-site releases are emissions from a facility to the environment as a result of normal operations or accidents, including emissions to the air, discharges to surface water, disposal onto or into the ground, and underground injection. Although underground injection is an approved method for disposal is some states, it not an approved method of hazardous waste disposal in Delaware, and thus has not been reported by any facility in Delaware since reporting began.

Figure 4 shows the on-site releases reported in the state. A large portion, eighty one percent, of the total on-site release is to air. Further analysis of the on-site releases is presented in Figures 5, 6, and 7 below, showing the top 15 chemicals and their releases to air, water, and land.

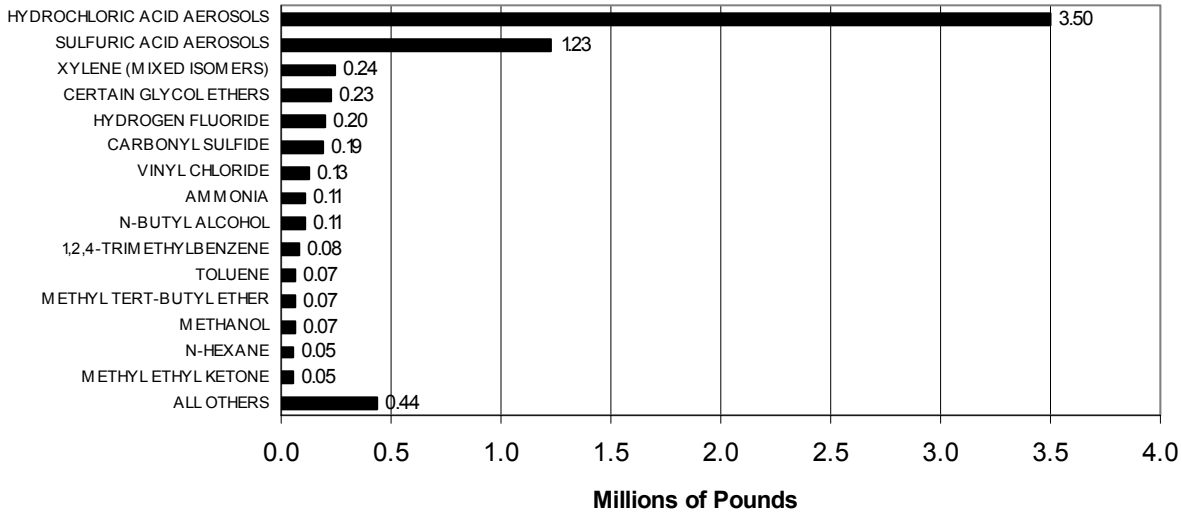
FIGURE 4
2001 ON SITE RELEASES



Releases to Air

Figure 5 provides an illustration of the relative release of the top 15 chemicals compared to all other 89 chemicals reported as released in 2001 to the air. As in all the years following the inclusion of power generating facilities, acid gasses top the list. Specifically, hydrochloric and

FIGURE 5
TOP 15 CHEMICALS RELEASED TO AIR



sulfuric acid aerosols (gasses) and hydrogen fluoride are released from power generating facilities located in all three counties. These three chemicals comprise 73% of statewide air releases. Xylene, which was reported by 10 facilities and represents 4% of all on-site releases to air, is primarily used as a solvent in paints for the automobile manufacturing industry. The two automobile manufacturing facilities in Delaware accounted for 88% of the xylene air releases. A similar condition exists for certain glycol ethers, where the automotive manufacturing industry accounted for over 94% of the releases from eight reporting facilities.

Releases to Water

TABLE 6
RELEASES TO WATER BY WATERSHED

WATERSHED	NO. OF FACILITIES	NO. OF REPORTS*	RELEASE (IN POUNDS)
DELAWARE RIVER	7	49	120,404
INDIAN RIVER	1	1	2,900
LITTLE MILL CREEK	1	1	360
NAAMANS CREEK	1	6	34
NANTICOKE RIVER	1	2	136,338
RED CLAY CREEK	1	1	2,252
SAVANNAH DITCH	1	1	310,000
SWAN CREEK	1	1	1,649
STATE TOTAL	**14**	**62**	**573,937**

* Showing an amount released

As can be seen in Figure 4 on page 11, releases to water were much lower than releases to air. Table 6 provides the amount of TRI chemicals released to each watershed that received a TRI chemical. Nitrate compounds was the top chemical released at 77% of the total water release, followed by manganese compounds (10%) and sodium nitrite (2%). See Figure 6 on the next page. Nitrates are formed by biological treatment of nitrogen-containing compounds such as ammonia and were primarily reported by Perdue Georgetown and DuPont Seaford. The influence of the nitrate and manganese compounds can be seen in the releases to the Savannah Ditch (Perdue Georgetown), Nanticoke River (DuPont Seaford) and to the Delaware River (DuPont Edge Moor, Edge Moor/Hay Road Power Plant). DuPont Edge Moor reported 60% of the total manganese release to water with 34,499 pounds followed by the Edge Moor/Hay Road power plant, with 36%, or 20,559 pounds. Manganese compounds are formed as a result of ore refining and from impurities in coal used in the power generating facilities.

Not every report shows a release to its listed watershed. For example, of the 68 reports listing the Delaware River as their destination watershed, only 49 reports show an actual release quantity to the Delaware River. The other 19 met the reporting requirements listed on page 1 and may have released chemicals to other media, but did not report any amounts released to the Delaware River.

TABLE 7
RELEASES TO WATER BY BASIN

BASIN	RELEASE (IN POUNDS)
CHESAPEAKE	136,338
DE BAY	357,549
INLAND BAYS	4,549
PIEDMONT	75,501
STATE TOTAL	**573,937**

Table 7 provides the total amount of TRI chemicals released to each basin in the state of Delaware. The Piedmont Basin contains lands that drain into the portion of the Delaware River above New Castle, and the Inland bays include lands that drain into the Indian River Bay/Rehoboth Bay area. All the watersheds except the Nanticoke and Indian Rivers and Swan Creek eventually feed into the Delaware Bay.